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T-shirts designed by junior Michael Koch are being sold to fund Earth Day activities at the University. The shirts display a globe on the front and, on the back, the last stanza of "Magnitudes," a poem by Howard Nemerov, U.S. poet laureate and Edward Mallinckrodt Distinguished University Professor.

Day-long rally here to mark Earth Day

Amid the sit-ins and protest marches of 1970, a senator from Wisconsin, Gaylord Nelson, suggested staging teach-ins about the environment. The idea spread and Earth Day was born.

On Sunday, April 22, 1990, the 20th national Earth Day will be celebrated. Along with more than 1,500 other universities and colleges around the country, Washington University will participate in this year's celebration.

To avoid conflict with Thurtene Carnival, the University officially will observe Earth Day on Friday, April 13. An all-day rally beginning at 10 a.m. will be held in Bowles Plaza.

According to Walter H. Lewis, Ph.D., professor of biology, Earth Day serves as a reminder about the importance of public awareness and support in solving environmental problems. "If the public doesn't know about the implications of the shrinking rain forest, then how can the public offer support," says Lewis, who, along with his wife, Memory Elvin-Lewis, Ph.D., has been studying plants that the Jivaro Indians of the Amazon rain forest use for medicine. Lewis is among the faculty and students scheduled to talk at the rally.

In addition to the lectures by faculty and students on various aspects of the environmental movement, representatives from such groups as the Rainforest Alliance and the Sierra Club will be at the rally to distribute information. A trash sculpture will be presented to University Food Services in demonstration of how much Styrofoam, plastic and paper is wasted each day in campus eateries.

Because threats to the environment like the recent Alaskan oil spill are still a part of daily life, students are voicing their growing concern for the planet's safety. Senior Kris Sarri, a member of the University's Earth Day committee and Mortar Board, recently led a campus effort to encourage Missouri Rep. Richard Gephardt to work for the environment. More than 1,300 students signed face masks like those used when working with hazardous chemicals, which were then presented to Gephardt, along with a plea to support stronger clean air legislation.

Washington University students also are organizing a bush- and tree-planting ceremony that will turn a vacant lot in an economically depressed area of St. Louis into a park. Fraternities, sororities, dorm floors and social action groups are raising money as part of the national Adopt-an-Acre project in the Belize rain forests.

In addition, students here are conducting a campus environmental audit. After determining how much waste is generated and how much recycled paper is used on campus, the students will present an environmental impact statement to the administration. And to demonstrate their support for conservation, students are taking a "green pledge," a pledge that they will use recycled products and support candidates who are for the environment. More than 500 students have signed green pledges to date.

T-shirts, designed by junior Michael Koch, are being sold to fund campus Earth Day activities. The shirts display a globe on the front and, on the back, the last stanza of "Magnitudes," a poem by Howard Nemerov,

'One of the old boys'

Engineer traces earliest science lab to Greek philosopher

"Remember the Pythagorean Theorem: The square of the length of the hypotenuse of a right triangle equals the sum of the squares of the lengths of the other two sides..."

Your high school geometry teacher

A professor of mechanical design at Washington University has traced the world's earliest known research laboratory to the Greek scientist and philosopher Pythagoras of Samos.

In a paper that probes the origins of several scientific tools and principles, Andrew D. Dimarogonas, Ph.D., also shows that Pythagoras developed a scientific axiom previously attributed to 17th-century scientist Galileo Galilei. Moreover, Dimarogonas offers a novel interpretation of a line in a famous Greek play that reveals the existence of the pendulum in 4th-century Greece — the earliest mention of the pendulum in any literature. Dimarogonas' paper, "The Origins of Vibration Theory," appears in the May 1990 issue of the *Journal of Sound and Vibration*, published by Academic Press, a division of Harcourt, Brace and Jovanovich.

Dimarogonas, W. Palm Professor of Mechanical Design, is an expert in vibrations and mechanical design. The engineering professor, who has a special interest in the history of mechanics, was instrumental in the development of the Washington University Computer Integrated Manufacturing Laboratory, a facility featuring innovative applications of computers that promote efficiency through automated manufacturing and computer-aided design.

Drawing upon the writings and illustrations of the Roman author Boethius (480-524 A.D.), Dimarogonas shows that Pythagoras, whose geometric theorem has been taught to every geometry student for centuries, developed a vibration research laboratory during the 5th century B.C.

"It is generally believed that the ancient Greeks were only theoreticians and not experimentalists," Dimarogonas says. "With many philosophers this is true, but it is not applicable to everyone — certainly not Pythagoras nor Archimedes, nor Heron. The sciences of mathematics and mechanics and the theory of vibration, a subdivision of mechanics, were defined rigorously in the middle of the first millennium B.C. by Pythagoras and others. There is a small, but adequate body of literature to illustrate this."

"This is a surprising and illuminating find. ... it is the first time the word laboratory has been associated with one of the 'old boys.'"

— Richard Hartenberg
 Northwestern University

Dimarogonas cites a passage by Boethius that describes a legendary incident in which Pythagoras (circa 570 to 497 B.C.) passed a metal shop — perhaps a precursor to the village smithy — and was struck by the different tones made by the ringing vibrations of hammer on metal. Pythagoras conducted an impromptu experiment, finding to his surprise that the different vibrations were not a result of the variations in strength of the men swinging the hammers (the excitation), but rather the different sizes, or mass, of the hammers.

He weighed the different hammers and noted their ratios and their relationship to sound consonances,

establishing, says Dimarogonas, integer fractions and multiples of basic sounds made by musical instruments, as well as a rational method of measuring sound frequencies.

"Pythagoras employed the experimental method, upon which all science is based, and proved the natural frequency of vibrating systems. Furthermore, when he realized that the various tones were made by different hammer sizes and not the difference in arm strength, he conducted further experiments to prove that the natural frequency of a system is a property of that system and not something dependent on external excitation."

This last theory, which applies to any physical system, was previously thought to have been expounded only in the past 300 years, starting with Galileo's observation of the isochronism, or time-measuring property, of the pendulum. Not until the late 19th century, with the writings of British scientist Lord Rayleigh, was the theory explicitly stated.

Boethius also describes Pythagoras' later work in his home with several simple systems such as vibrating strings, pipes, vessels and circular plates and the dependence of their natural frequencies on dimensions as further proof that the Greek purposefully developed a laboratory to test sound and vibration principles.

A drawing from Boethius' work showing Pythagoras happily hammering a series of bells is final "proof of the pudding" that Pythagoras had a laboratory, Dimarogonas asserts.

Rarely recorded science

"This is a surprising and illuminating find," says Richard Hartenberg, Ph.D., professor emeritus of mechanical engineering at Northwestern University, who for 29 years has taught a course on the history of engineering. "It is the first reference to

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Disaster drill: Junior Matt Hardin, a member of the University's Emergency Support Team (EST), works on student volunteer junior Meg Baho during an April 1 mock earthquake disaster drill for single building damage at the John M. Olin School of Business, Simon Hall. More than 20 of the 35 EST members participated in the third annual drill, which helps test the EST disaster plan and gives EST a chance to work with outside emergency support teams. Sue Shapiro, co-chair of the EST disaster committee, said the rehearsal was a success, though finding patients quickly was an area the EST members could improve upon. The Clayton and Richmond Heights fire departments participated as well as volunteers from Scott Air Force Base, who helped prepare the moulage (simulated injuries).

Economics scholar to give lecture; conference honors Minsky's work

Award-winning economics scholar and author Benjamin M. Friedman will discuss "Risks in Our High-Debt Economy: Depression or Inflation?" at 11 a.m. Friday, April 20, in Graham Chapel. The lecture, part of the Assembly Series, is free and open to the public.

Friedman, the William Joseph Maier Professor of Political Economy at Harvard University, also will be the keynote speaker at an April 20-21 conference that honors the work of Hyman Minsky, a professor of economics at Washington. The conference, which focuses on financial risk, government policy and macroeconomic performance, is expected to attract more than 35 of the nation's leading economics scholars.

Minsky, an authority on monetary theory and financial institutions, is known for his interpretation of Keynesian Theory as a prologue to the analysis of business cycles and for work on the integration of financial and production facets within an economy. He is leaving the University

to join the Jerome Levy Economics Institute.

Friedman is author of several books, including the 1988 *Day of Reckoning: The Consequences of American Economic Policy Under Reagan and After*, for which he received the George S. Eccles Prize from Columbia University for excellence in writing about economics. Friedman's research has focused on financial markets and monetary and fiscal policy.

Friedman is director of financial markets and monetary economics research at the National Bureau of Economic Research. He also is a member of the Brookings Panel on Economic Activity and the Council on Foreign Relations. A former Marshall Scholar at Cambridge University, Friedman worked with the Morgan Stanley & Co. investment banking firm before joining Harvard's faculty in 1972.

For information on the lecture, call 889-4620. For information on the conference, call 889-5632.

Two art workshops will be offered

Two workshops, one on "seeing more color," and the other on landscape painting, are being offered by the University's Fine Arts Institute. Both programs are designed for adult artists in the local community.

Phyllis Plattner, an artist whose watercolor and oilstick still lifes can be seen in St. Louis' Locus Gallery, the Missouri Botanical Garden and the St. Louis Art Museum, will conduct the "Seeing More Color" workshop from 9 a.m. until noon April 16-20 at the Center of Contemporary Arts, 524 Trinity Ave., in University City. The course is designed to "explore new depths of color perception." This program is open to artists who work

in any medium. The registration fee is \$225.

A second workshop, titled "Land and Cityscapes Painting," will be taught by renowned local artist William Quinn from 9 a.m. until noon on Mondays, Wednesdays and Fridays, May 30-June 18, in Bixby Hall. Quinn has been a faculty member of the School of Fine Arts for 32 years. This is the last summer school class he will teach before retiring. Registration is \$225 and must be received by April 15.

For more information on either workshop, call the Fine Arts Institute at 889-4643.

Science lab — continued from p. 1.

a laboratory appearing this early that I know of. And it is the first time the word laboratory has been associated with one of the 'old boys.'"

Literature, or the lack of it, is what makes the scientific contributions of the ancients, especially the Greeks, ambiguous if not enigmatic. Much of the knowledge between 600-300 B.C. was lost, not recorded or was sworn to secrecy. The Pythagoreans, for instance, were a mysterious, mystical group who, recent evidence suggests, delved into mind-altering substances. Those who divulged the Pythagoreans' secrets were known to pay with their lives.

Pitch and pendulum

It is Galileo who is most often credited with studying the pendulum's properties and advancing its applications, and, at times, with inventing the apparatus. But Dimarogonas contends that the pendulum was known and used by the ancient Greeks and Chinese long before Galileo measured its isochronism in the 17th century. The pendulum and its variants are major components of a wide assortment of machinery, most notably the clock. It is known to everyone who has read Poe's "The Pit and the Pendulum," or observed catapults in action in "Spartacus," "Cleopatra" or any of the lesser Grade B movies of that genre.

"To say Galileo is the inventor of the pendulum is quite simply absurd, just as it is erroneous to say Newton developed his laws of physics on his own, when some of these laws already were stated by Aristotle and other ancients," Dimarogonas says. "Yet this is all too often the way science is depicted in history. Both men should be credited with making their principles known and understandable to many. But we must be conscious of the roots of these developments."

Dimarogonas says legend suggests that Daedalus, who lived in mid-2000 B.C., invented the pendulum. The first tangible proof of its existence comes from 6th-century B.C. vases that show them as components of an early plumb line for spinning and leveling devices. Dimarogonas believes he has found the first written reference to the pendulum as a timing device in the 4th-century B.C. comedy "Frogs" (Ranae). Aristophanes, the author, makes a direct reference: "The music should be balanced with an oscillator," in Greek, talanto mousiki stathmissetai.

"This phrase in Greek is a double entendre that is subject to different interpretations," says Dimarogonas. "One is 'the poetry should be weighted in gold,' which is a metaphor meaning 'the poet should be paid what he is worth,' Aristophanes' joke. The oscillator is actually a reference to the metronome, a timing device that is essentially a pendulum. We must infer from this that Aristophanes knew that music is balanced, or timed, with an oscillator; otherwise, how could he have used it as a joke?"

The Chinese used the pendulum, Dimarogonas says, as the world's first seismology equipment about 132 A.D. A tall, circular instrument with the pendulum as its major component, the device held balls that would fall into cups placed in north-south-east-west arrangement so that when the pendulum would vibrate after absorbing the shock of a tremor through the soil, the balls would fall in the direction of the tremor.

Likewise, the Greeks, Chinese and Middle-Easterners used pendulums as "vibration transducer-amplifi-

ers," or devices that detected the underground tunneling of enemies laying siege to cities.

History of scientific thought

Dimarogonas' research will have reverberations in both the scientific and historical communities. Two researchers at Purdue University, Werner Sodell, Ph.D., professor of mechanical engineering, and Vernard Foley, Ph.D., professor of history, have a strong interest in the subject. The two are co-authoring a book on Greek mathematician Archimedes, an ancient whose mathematics, the authors contend, is in part an outgrowth of engineering problems that perplexed the ancient Greeks.

"The field of vibration research is a very vast one that is open to a lot of interpretation," says Sodell. "Personally, I tend to take a conservative view, so I might hesitate to call Pythagoras' set-up a laboratory. However, I don't quibble with that interpretation. Research such as his (Dimarogonas') broadens the interest in this field."

Foley notes that Dimarogonas sheds light on a fascinating era that is often typecast. "Dr. Sodell and I are convinced the ancient Greeks and Romans were doing more interesting things than spouting philosophy or plundering countries, and Dimarogonas' work supports that," says Foley. "The technological advances these cultures were making are underestimated, if not ignored."

As for Pythagoras, the stalwart who Foley calls "a brilliant mathematician and flaming mystic," he cribbed his own famous theorem, memorized by generations of high school geometry students.

"The theorem goes back to at least the Babylonians," Dimarogonas says. "There is good evidence from scripture on walls and so forth that the other cultures had been using the theorem for their building projects, among other uses. Like Newton and Galileo, Pythagoras is the first to popularize a principle, in this case the theorem, so that he has become associated with its discovery."

Tony Fitzpatrick

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NOTABLES

Shirley K. Baker, dean of university libraries, has been appointed to serve on the Association of Research Libraries' Committee on Bibliographic Control. The three-year appointment calls for participation in examining issues and defining future activities for the association.

Mario A. Blanc, Ph.D., assistant professor of Spanish, chaired three sections at recent meetings: "19th-century Peninsular Literature" at LA CHISPA in New Orleans; "Peninsular Literature" at the Mountain Modern Language Association Conference in Las Vegas; and "The Peruvian Narrative" at the Mid-America Conference at the University of Kansas.

Dorsey D. Ellis Jr., J.D., dean and professor of law, was a panelist at the Deans' Workshop of the Section of Legal Education and Admission to the Bar at the mid-winter meeting of the American Bar Association. The meeting focused on "Enhancing Numbers and Status of Minorities in Law Schools and in the Profession."

Raymond L. Hilgert, D.B.A., professor of management and industrial relations, presented a seminar, "Motivation and Leadership Styles," as part of staff development for Washington University's Division of Student Affairs.

Marcy Kraus, Ph.D., director of undergraduate business student services in the John M. Olin School of Business, moderated the session on "Pre-enrollment Advising for Prospective Students" at the annual conference of the National Academic Advising Association in Houston.

Van McElwee, instructor in the Performing Arts Department, had the broadcast rights to his videotape "Inside" purchased by Canal in Paris, France. The work will be shown in France and Monaco for six months. The Downtown Community Television Center in New York City showed two of McElwee's works in March.

James McGarrell, professor of fine arts, had his works exhibited through the month of March at the Frumkin-Adams Gallery in New York City. Exhibited works included one large canvas and mixed media drawings on monotypes, which were executed while he was serving as a visiting artist at several other university art departments.

P. Jean Milburn, assistant dean and director of MBA admissions and financial aid in the John M. Olin School of Business, recently was appointed a director of the Consortium for Graduate Study in Management. The consortium, founded in 1967 at Washington University by **Sterling Schoen**, Ph.D., emeritus professor of management, is a nine-university alliance formed to encourage minorities to study management at the graduate level and become business managers. Milburn also is

advising the selection committee for the first class of the Minority Summer Institute, jointly sponsored by the Graduate Management Admission Council and the American Assembly of Collegiate Schools of Business to encourage high school minority students to consider a business doctorate.

Gloria W. White, vice chancellor of personnel, was elected director-at-large of the Personnel Accreditation Institute's (PAI) board of directors. PAI is a research and accrediting non-profit organization founded by and affiliated with the Society for Human Resource Management (SHRM). PAI exists to recognize human resource professionals who have met, through demonstrated professional experience and the passing of a rigorous examination, the institute's defined standards for a professional in human resources or a senior professional in human resources. SHRM is the world's largest professional membership organization dedicated exclusively to the advancement of human resource management.

Gerhild Scholz Williams, Ph.D., professor of German and comparative literature and chair of the German department, presented papers on early modern German literature at the 16th-century Studies Conference in Minneapolis and at the annual conference of the Modern Language Association in Washington, D.C. She also will talk on early modern German and French literature at the 25th annual meeting of the Renaissance Society being held in Toronto this month and at a conference on Women and the Professions in the Early Modern Period organized at Amherst College. She has been invited to be a visiting scholar at the University of Lausanne, Switzerland, in June 1990. During that time, she will work and meet with students and colleagues in early modern studies. She also will participate in a conference on late medieval didactic literature in Lausanne and St. Gallen, Switzerland.

Stuart D. Yoak, Ph.D., university registrar, delivered a presentation at the 1990 Conference of the Registrars of the Association of American Universities. The subject of his address concerned the number of data sharing projects in higher education and the security needs associated with student record data.

Have you done something noteworthy?

Have you: Presented a paper? Won an award? Been named to a committee or elected an officer of a professional organization? The Washington University Record will help spread the good news. Contributions regarding faculty and staff scholarly or professional activities are gladly accepted and encouraged. Send a brief note with your full name, highest-earned degree, current title and department along with a description of your noteworthy activity to Notables, Campus Box 1070, or by electronic mail to p72245SS at WUVMC. Please include a phone number.

Fine arts graduate students display work

Paintings, prints, sculptures and glasswork by Washington University School of Fine Arts graduate students are on exhibit through April 15 in the Gallery of Art in Steinberg Hall.

This annual exhibit of student works marks the end of their formal training and the beginning, for most, of their professional careers.

The free exhibit, titled "M.F.A. I," features the works of seven master's degree candidates: painters Charles Caldemeyer and Shelly Hendrickson;

sculptors Ronald Stephen Gurowitz and Moira Lewis; glassmaker Benjamin Mensch; and printmakers Roxanne L. Smith and Steven Zeilstra.

A second exhibit, titled "M.F.A. II," will feature the work of seven other graduate students and will run from April 20-29.

The Gallery of Art is open 10 a.m.-5 p.m. weekdays and 1-5 p.m. weekends.

For more information, call 889-4523.

Business school will present four alumni awards and Dean's Medal

The John M. Olin School of Business will present four distinguished alumni awards as well as the school's Dean's Medal during a dinner on April 18 at the new Ritz-Carlton Hotel in Clayton.

The Dean's Medal for exceptional service to the school will be presented to Vernon W. Piper, B.S.B.A. '35, and his wife, Marion K. Piper. The Pipers, lifetime members of the William Greenleaf Eliot Society, have helped lead several fund-raising drives, as well as personally endowing both a scholarship and a professorship at Olin.

Olin presents its Distinguished Business Alumni awards annually to four graduates whose successful careers have shown the characteristics of leadership, progressive thinking, high standards, uncompromising integrity, commitment, courage and confidence. The 1990 recipients are Lee Abraham, Bruce V. Carp, Mahlon Rubin and Lewis N. Wolff.

Abraham, B.S.B.A. '49, is chairman and chief executive officer of Associated Merchandising Corp., one of the largest and oldest retail cooperatives. Abraham manages 22 overseas offices that together have provided

member stores with more than \$3 billion in merchandise.

Carp, B.S.B.A. '67, is vice chairman and chief administrative officer of Salomon Brothers Inc. in New York. At age 44, Carp is the fourth most senior partner in terms of longevity at Salomon. He oversees the firm's technology, operations, facilities, human resources and general services departments.

Rubin, B.S.B.A. '48, is chairman of the executive board, Rubin, Brown, Gornstein & Co., the largest one-office accounting firm outside of New York and Chicago. The firm has grown from a partnership that Rubin formed in 1952 to become the 36th largest accounting firm in the country.

Wolff, M.B.A. '61, is managing partner, Wolff-Sesnon-Buttery, a leader in the real estate development business. Wolff's award-winning \$200 million redevelopment of an urban center in San Jose, Calif., has been the cornerstone of his 24-year career. His firm recently moved into hotel development, ownership and management.

For more information on the dinner, call Jill Williams at 889-5872.

Award-winning poetry critic to give talk

Helen Vendler, William R. Kenan Jr. Professor of English and American Language and Literature at Harvard University, will give the Phi Beta Kappa/Sigma Xi lecture at 11 a.m. on Wednesday, April 18, in Graham Chapel.

Vendler's lecture, titled "Some Phi Beta Kappa Poems," is part of the Assembly Series. The lecture is free and open to the public.

Vendler, who is the first woman to receive a university chair at Harvard, is a leading critic of English poetry. Her essays have appeared in the New Yorker and the New York Review of Books. She has been a judge for the Pulitzer Prize in Poetry and for the Guggenheim Foundation awards in literary criticism.

Vendler has written many volumes on individual poets — Wallace Stevens, John Keats and George Herbert, for example — as

well as general studies of contemporary American and English poetry. Her 1969 book, *On Extended Wings: Wallace Stevens' Longer Poems*, won Vendler the James Russell Lowell Prize of the Modern Language Association. More recent works include *The Harvard Book of Contemporary American Poetry* (1985) and her 1987 book *Voices and Visions: American Poets*, which the Public Broadcasting Service adapted into a 13-week series on American poets.

Vendler, a 1971 Guggenheim Fellow, has received several Fulbright fellowships and lectureships. She is the 1981 recipient of the National Book Critics' Circle Award for criticism and is a member of Phi Beta Kappa.

The lecture honors the initiates of Phi Beta Kappa and Sigma Xi, two academic honoraries at Washington. For more information on the lecture, call 889-4620.

Earth Day — continued from p. 1

U.S. poet laureate and Edward Mallinckrodt Distinguished University Professor of English at Washington.

The official St. Louis Earth Day celebration will be held on the national April 22 date in Forest Park.

NEWSMAKERS

Washington University faculty and staff make news around the globe. Following is a digest of media coverage they have received during recent weeks for their scholarly activities, research and general expertise.

In an alcoholic's brain, something is awry, says an article in the Feb. 28 *Chicago Tribune*. Most leading alcoholism researchers believe that in many cases at least part of the problem is inherited. C. Robert Cloninger, M.D., professor of genetics and professor and head of psychiatry, is one of the pioneers studying the role genetics plays in alcoholism. The article also appeared in the Jan. 21 *Scranton (Pa.) Sunday Times*. Another

article on alcoholism quoting Cloninger appeared in the Feb. 17 *Oakland Tribune*.

The father who comes home for dinner with his family and spends the evening providing counsel may soon become an endangered species, says an article in the Feb. 19 *New York Times*. For various reasons, most fathers work 12-hour days. Don Conway-Long, instructor of women's studies, says in the article that the hearts and minds of today's fathers are in the right place — if only their bodies could be there, too. The story also appeared in the *Detroit Free Press* on Feb. 20, the *Portland Oregonian* Feb. 21 and the *Fresno Bee* Feb. 23.

CALENDAR

April 12-21

LECTURES

Thursday, April 12

9:30 a.m. Dept. of Internal Medicine 14th Annual I. Jerome Flance Visiting Professor of Medicine Lecture, "Alpha-1 Antitrypsin Deficiency: Mutations, Current Therapy and Strategies for Gene Therapy," Ronald G. Crystal, chief, pulmonary branch, National Heart, Lung and Blood Institute of the National Institutes of Health. Clopton Amphitheatre, 4950 Audubon Ave., Wohl Research Lab.

Noon. Dept. of Genetics Seminar, "Genetic Analysis of Centromere Function in Yeast," Phil Hieter, Dept. of Molecular Biology and Genetics, Johns Hopkins Medical School. Room 816 McDonnell Medical Sciences Bldg.

1:10 p.m. George Warren Brown School of Social Work Spring Lecture Series, "Labor and Unemployment in America: A Union View," William Stodghill, president, Local 50 Service Employees Union. Brown Hall Lounge. For more info., call 889-6606.

4 p.m. Assembly Series Lewin Lecture, "Human Rights and Legal Rights," Alice Erh-Soon Tay, Challis Professor of Jurisprudence, The U. of Sydney, Australia. Room 403 Mudd Law Bldg. For more info., call 889-4620.

4 p.m. Dept. of Chemistry 32nd Joseph W. Kennedy Memorial Lecture, "Controlled Experiments in Science and in Life," Ronald Breslow, Samuel Latham Mitchell Professor of Chemistry, Columbia U. Room 458 Louderman Hall. (Coffee will be served at 3:30 p.m. in Millstone Lounge, Louderman Hall.)

Friday, April 13

Noon. Dept. of Cell Biology and Physiology Seminar, "Gene Expression and Chromatin Structure in Drosophila," Sarah Elgin, WU prof. of biology. Cell Biology Library, Room 4914, South Bldg.

Noon. School of Medicine Transplant Seminar, "The Cellular Basis of Allograft Rejection and Acceptance," Bruce M. Hall, assoc. prof. of medicine, Stanford U. School of Medicine. 3rd Floor Aud., Children's Hospital.

3:30 p.m. Asian Studies Science and Ideology in China Lecture, "Fang Lizhi, Science and Democracy," Yao Shuping, member, Chinese Academy of Science's Institute for Science Policy and Management. Room 103 Simon Hall. For more info., call 726-4448.

4 p.m. James L. O'Leary Division of Experimental Neurology and Neurological Surgery 35th George H. Bishop Lecture in Experimental Neurology, "Neurons and Synapses," Sanford L. Palay, Bullard Prof. of Neuro-anatomy, Harvard U. Moore Aud., North Bldg. For more info., call 362-3600.

4 p.m. Assembly Series Language and Culture Lecture, "Cross-linguistic Studies of Language Processing and Language Learning," Elizabeth Bates, Dept. of Psychology, U. of California, San Diego. Women's Bldg. Lounge. For more info., call 889-4620.

Monday, April 16

8 p.m. School of Architecture Monday Night Lecture Series, "Seven Lamps of Finnish Architecture: From Contradiction to Identity," Arne Nevanlinna, director, master's program in architecture and urban design, U. of Technology, Helsinki, and WU visiting prof. of architecture. Steinberg Hall Aud. For more info., call 889-6200.

Tuesday, April 17

11 a.m.-12:30 p.m. Dept. of Asian and Near Eastern Languages and Literatures Lecture, "Zen and the Art of Everyday Life," Sheng-yen, resident master, Ch'an Meditation Center, Elmhurst, N.Y. Co-sponsored by the Religious Studies Committee. Women's Bldg. Lounge. For more info., call 889-5156.

6:30 p.m. Dept. of Germanic Languages and Literatures Lecture, "Eine Entexilierung aus Deutschland: Eine kurze Lesung und ein Kurzer Film," Antonio Skarmeta, WU visiting prof. of Romance languages. Hurst Lounge, Duncker.

Wednesday, April 18

11 a.m. Assembly Series Phi Beta Kappa/Sigma Xi Lecture, "Some Phi Beta Kappa Poems," Helen Vendler, Kenan Professor of English, Harvard U. Graham Chapel. For more info., call 889-4620.

4:15 p.m. Dept. of Philosophy 12th Helen Stenner Memorial Essay Competition Winner's Colloquium, "Meaningful Fictives: Philosophical Analysis of the Theories of Language of Bertrand Russell and Nelson Goodman With Reference to Fictive Expressions," Catherine McKeen, grad. student, WU Dept. of Philosophy. Hurst Lounge, Duncker Hall.

7:30 p.m. Bookmark Society Lecture, "Sherlock Holmes' Personal Library," Jeffery L. Michelman, partner, Popkin and Stern law firm, member, Sherlock Holmes Society of London and the Baker Street Irregulars. May Aud., Simon Hall. For more info., call 889-5400.

8 p.m. Dept. of English Fiction and Poetry Readings by WU Writing Program students. Hurst Lounge, Duncker Hall.

Thursday, April 19

Noon. Dept. of Genetics Seminar, "Mechanism of Osmotic Control of Transcription in Salmonella," Laslo Csonka, Dept. of Biological Sciences, Purdue U. 816 McDonnell Medical Sciences Bldg.

3:45 p.m. Dept. of Chemistry Seminar, "Molecular Building Blocks for Solid-State Materials," Paul Fagan, Du Pont. Room 311 McMillen Lab.

3:45 p.m. Dept. of Anthropology Colloquium, "The Broken Circle: Structure Shock for Lao Refugee Women," Ann Ryerson, director, Cross-Cultural Research and Development, International Institute of Metropolitan St. Louis. Room 101 McMillan Hall.

4 p.m. Assembly Series Lewin Lecture, "Individuals and the New Collective," Alice Erh-Soon Tay, Challis Professor of Jurisprudence, The U. of Sydney, Australia. Women's Bldg. Lounge. For more info., call 889-4620.

4 p.m. Dept. of Earth and Planetary Sciences Charles W. Buescher Colloquium, "Chondritic Meteorites and the Compositions of Planets," Harry McSweeney Jr., chair, Dept. of Geological Sciences, U. of Tennessee, Knoxville. Room 102 Wilson Hall.

8 p.m. Dept. of English Colloquium, "Ganymede and the Erotics of Humanism," Leonard Barkan, Franklyn Bliss Synder Professor of English and Art History, Northwestern U. Hurst Lounge, Duncker Hall.

Friday, April 20

11 a.m. Assembly Series Hosts "Financial Risk, Government Policy and Macroeconomic Performance: A Conference in Honor of Hyman P. Minsky." Keynote speaker is Benjamin Friedman, William Joseph Maier Professor of Political Economy, Harvard U., and author, *Day of Reckoning: The Consequences of American Economic Policy Under Reagan and After*. Graham Chapel. For more info. on lecture, call 889-4620. For more info. on conference, call 889-5632.

Noon. Dept. of Cell Biology and Physiology Seminar, "Regulation of Muscle Properties by Motor Neurons," Robert Wilkinson, WU asst. prof. of cell biology and physiology. Cell Biology Library, Room 4914, South Bldg.

PERFORMANCES

Sunday, April 15

2 p.m. Hillel Foundation Presents "The Gates are Closing," performed by the Hillel Jewish Theater Group and directed by local playwright Julie Heifetz. Goldfarb Hillel House, 6300 Forsyth Blvd. For more info., call 727-9757.

Friday, April 20

8 p.m. Edison Theatre "OVATIONS!" Series Presents Laurie Anderson, renowned performance artist. (Also Sat., April 21, same time. Both Friday and Saturday 8 p.m. performances are sold-out. A 2 p.m. April 21 performance has been added.) Edison Theatre. Cost: All tickets are \$20. For more info., call 889-6543.

MUSIC

Thursday, April 12

9 p.m. African and Afro-American Studies Program Presents the David Murray Quartet, a New York City-based jazz band featuring pianist John Hicks. (Also Fri., April 13, same time.) Co-sponsored by Contemporary Jazz Society of St. Louis. Holmes Lounge, Ridgley Hall. Cost: \$15. For ticket info., call 889-5690 or 361-7266.

Saturday, April 14

1 p.m. WU Spiritual Friendship Ministries Inc. Rehearsals for the WU Gospel Mass Choir. All students, faculty, alumni and staff may join. Interested instrumentalists (brass, woodwinds and strings) also are welcome. Room B-2 Blewett Hall. For more info., call 862-1562.

Friday, April 20

8 p.m. Dept. of Music Presents a Concert by the WU Vocal Jazz Ensemble, Janet Krupnik, director. Steinberg Hall Aud. For more info., call 889-5574.

EXHIBITIONS

"Prints by Johannes Lebek (1901-1985), a German Master of Woodcut." Olin Library, Special Collections exhibit. Through April 20. Olin Library, level 5. 8:30 a.m.-5 p.m. weekdays.

"Washington University Junior Art Exhibit."

Exhibition of works by juniors in the University's School of Fine Arts. Through April 15. Bixby Hall Gallery. 10 a.m.-4 p.m. weekdays; 1-5 p.m. weekends. For more info., call 889-4643.

"Washington University Fine Arts Collection." Collection includes European and American art from the post-World War II era, as well as ancient Greek vases. Through end of semester. Gallery of Art, upper and lower galleries, Steinberg Hall. 10 a.m.-5 p.m. weekdays; 1-5 p.m. weekends. For more info., call 889-4523.

FILMS

Thursday, April 12

7 p.m. Dept. of Romance Languages and Literatures French Film Series, "Au Revoir les enfants." Free. Language Lab, Room 210 Ridgley.

7 and 9 p.m. Filmboard Series, "The Bicycle Thief." \$2. Brown Hall.

Friday, April 13

7:30 p.m. WU Environment Action Group Film, "Where Have All the Dolphins Gone," narrated by George C. Scott. May Aud., Simon Hall. Free. For more info., call 362-6788.

7:30 and 9:30 p.m. Filmboard Series, "The Many Adventures of Winnie the Pooh." (Also Sat., April 14, same times, and Sun., April 15, at 2 p.m.) \$2. Brown Hall.

Midnight. Filmboard Series, "Spinal Tap." (Also Sat., April 14, same time, and Sun., April 15, at 9 p.m.) On Fri. and Sat., both the 9:30 p.m. and midnight films can be seen for a double feature price of \$3; both Sun. films can be seen for \$3. Brown Hall.

Monday, April 16

7 and 9:30 p.m. Filmboard Series, "Arsenic and Old Lace." (Also Tues., April 17, same times.) \$2. Brown Hall.

Tuesday, April 17

5:30 and 8 p.m. WU Performing Arts Dept. Presents The Filmed Stage Play Series, "Marat/Sade." Co-sponsored by St. Louis Art Museum. Cost: \$3 for general public; \$2 for students, senior citizens and WU faculty and staff. St. Louis Art Museum Aud. For more info., call 721-0067.

Wednesday, April 18

7 and 9:30 p.m. Filmboard Series, "Gertrud." (Also Thurs., April 19, same times.) \$2. Brown.

Thursday, April 19

7 p.m. Dept. of Romance Languages and Literatures French Film Series, "Le Grand chemin." Free. Language Lab, Room 210 Ridgley.

Friday, April 20

7 and 9:30 p.m. Filmboard Series, "Lethal Weapon 2." (Also Sat., April 21, same times, and Sun., April 22, at 7 p.m.) \$2. Brown Hall.

Midnight. Filmboard Series, "The Road Warrior." (Also Sat., April 21, same time, and Sun., April 22, at 9:30 p.m.) On Fri. and Sat., both the 9:30 p.m. and midnight films can be seen for a double feature price of \$3; both Sun. films can be seen for \$3. Brown Hall.

SPORTS

Friday, April 13

1 p.m. Women's Tennis. WU vs. Sangamon State U. Tao Tennis Center.

Saturday, April 14

Noon. Men's Baseball. WU vs. DePauw U. Kelly Baseball Field.

Monday, April 16

11 a.m. WU Varsity Golf. Washington University Classic. Greenbriar Country Club, 1/2 mile west of I-270, off of Big Bend.

4 p.m. Women's Tennis. WU vs. Principia College. Tao Tennis Center.

Tuesday, April 17

4 p.m. Men's Tennis. WU vs. Principia College. Tao Tennis Center.

Sunday, April 22

1 p.m. Men's Baseball. WU vs. Rose-Hulman Institute. Kelly Baseball Field.

MISCELLANY

Thursday, April 12

5:15 p.m. Newman Center Holy Thursday Liturgy, followed by a reception. Newman Center Chapel. For more info., call 725-3358.

9 p.m. Thurtene Rat Mug Nite. Umrathskellar. For more info., call 727-9574 or 727-8255.

Friday, April 13

3 p.m. Newman Center Good Friday Liturgy. Newman Center Chapel. (Also at 5:15 p.m. there will be the Stations of the Cross ceremony.)

Saturday, April 21

11 a.m.-8 p.m. Thurtene Carnival. (Also Sun., April 22, same times.) Campus parking lot at the corner of Millbrook and Skinker boulevards. For more info., call 727-9574 or 727-8255.

Calendar Deadline

The deadline to submit items for April 19-28 calendar of the Washington University Record is April 13. Items must be typed and state time, date, place, nature of event, sponsor and admission cost. Incomplete items will not be printed. If available, include speaker's name and identification and the title of the event; also include your name and telephone number. Send items to Andrew Cox, calendar editor, Box 1070, or by electronic mail to p72245ac at WUVMC.

Speeches, writings of Chinese scientist are lecture topic

Chinese historian of science Yao Shuping will give a lecture, titled "Fang Lizhi, Science and Democracy," at 3:30 p.m. Friday, April 13, in Room 103 Simon Hall.

The talk, the final one in a series titled "Science and Ideology in China," will focus on the speeches and writings of Chinese scientist and activist Fang Lizhi. The lecture is free and open to the public.

Fang, the Chinese astrophysicist who has spoken out for government reforms there, has been hiding in the U.S. embassy in Beijing since the massacre in Tiananmen Square last spring. Since 1986, when he was the vice-chancellor of the Science and Technology University in Hefei, the capital of Anhui province, Fang's speeches and writings have inspired students to demonstrate against the current government.

Yao, the Luce Professor of the History of Science at Smith College, also is well known among Chinese students in part because of the publication of both her and Fang's 1985-86 speeches. She is on leave from the Chinese Academy of Science's Institute for Science and Policy Management.

For information, call 726-4448.

Finnish architect gives international viewpoint in talk

An architect from Helsinki will give a lecture titled "Seven Lamps of Finnish Architecture: From Contradiction to Identity" at 8 p.m. Monday, April 16, in Steinberg Hall auditorium.

The lecture, which is free and open to the public, is part of the School of Architecture's Monday Night Lecture Series.

Arne Nevanlinna, a professor of architecture at Helsinki University of Technology, is a visiting professor of architecture at Washington University this semester. He has been teaching at the university in Helsinki since 1963 and is director of the master's program in architecture and urban design there. Nevanlinna received his degree from the university in 1952.

A practicing architect, Nevanlinna brings an international perspective to his views on architecture. In addition to teaching and practicing in Finland, he has traveled and taught in Kenya and the United States.

Nevanlinna has won many prizes in architectural competitions and has written extensively on architecture.

For more information, call 889-6200.